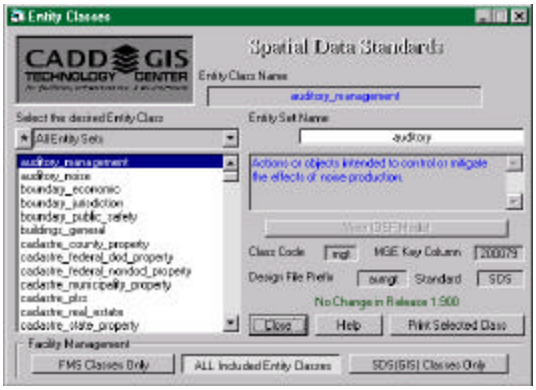
CADD/GIS TECHNOLOGY CENTER

for facilities, infrastructure, and environment

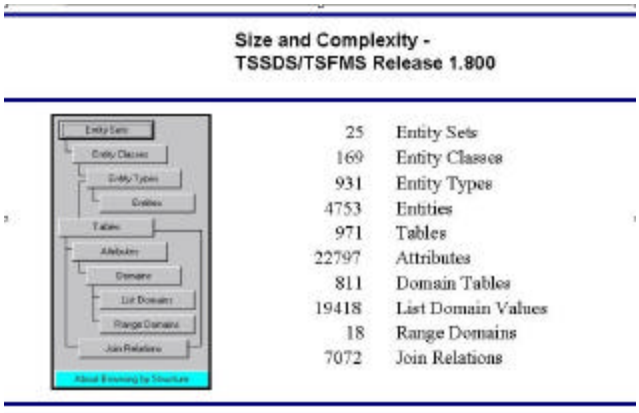
1999 Year in Review

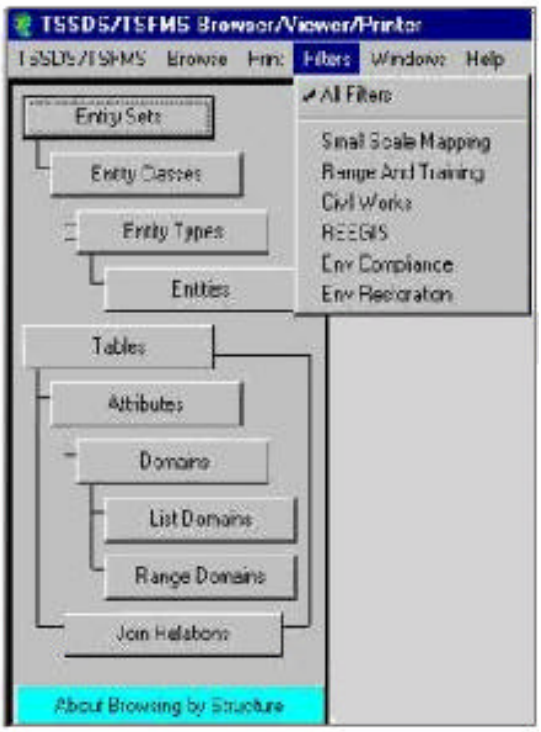
Two key events made 1999 a significant year for the Tri-Service CADD/GIS Technology Center — a new name and a new administrative structure. Now known as The CADD/GIS Technology Center for Facilities, Infrastructure, and Environment, the Center's new name reflects its expanded Federal role in developing and promoting consensus standards and providing meaningful business performance measurement systems to the CADD/GIS community at large. A newly created Board of Directors provides a strategic business and marketing vision for the Center, and a Corporate Staff ensures representation and participation from member agencies. 1998 was known as the "Year of the Standards" for the CADD/GIS Technology Center with the release of Spatial Data Standards (SDS) and the A/E/C CADD Standards. 1999 can easily be described as the "Year of the Standards and their application." Applications were developed to simplify and promote the use of the Standards.

Spatial Data Standards



The completion of the Tri-Service Spatial Data Standards (TSSDS) Release 1.8 in February 1999 marked a major milestone in the Center's development of Spatial Data Standards (SDS) for GIS implementations. Among its most significant accomplishments, this release (1) represented the first GIS implementations of the Federal Geographic Data Committee's (FGDC) Wetlands, Vegetation, and Soils standards; (2) included the Mississippi Valley Division's Regional Environmental and Engineering GIS (REEGIS); (3) developed "Filters" (predefined subsets of the standards) for REEGIS, Civil





Works, Range and Training, Small Scale Mapping, Environmental Restoration, and Environmental Compliance; and (4) included two interactive 32-bit software applications (i.e., the Browser and Generator).

In addition, 1999 marked the first year the CADD/GIS Technology Center offered TSSDS Implementation Workshops. Three workshops with nearly 100 students were conducted.

The Center also developed an Internet accessible database for recording customer comments, questions, and CD requests. A total of 284 comments, CD requests, etc., were received in FY 1999. Of this total, 127 were received from Department of Defense (DoD) personnel, 118 from commercial sources (e.g., architect/engineer (A/E) contractors and software vendors), 5 from other Federal Government organizations, 5 from organizations in foreign countries, 12 from local government organizations, 3 from state government organizations, 11 from universities, and 3 from utility companies. Over 4,400 CD-ROMs containing the TSSDS Release 1.8 were shipped throughout the world.

Facility Management Standards

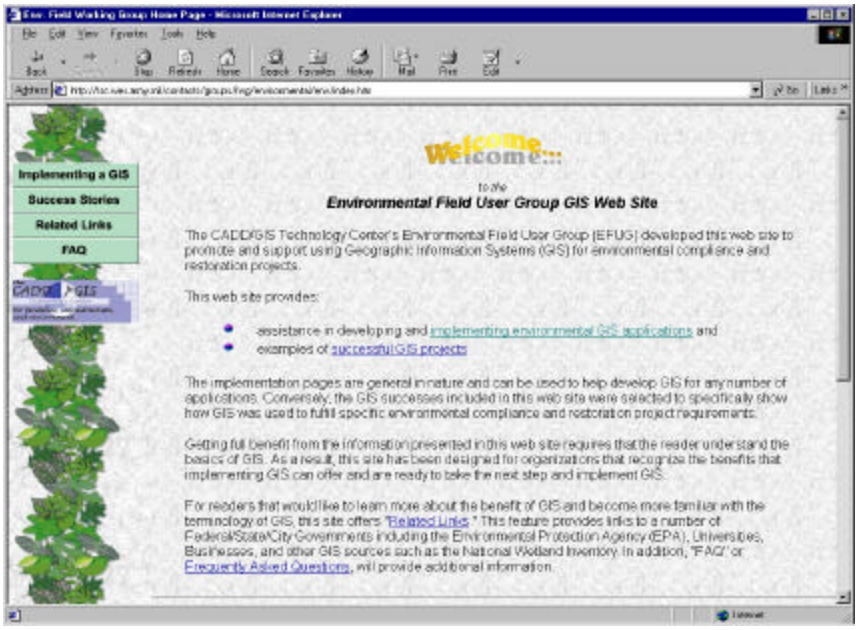
In February 1999, the first release of the Facility Management Standards (FMS) was incorporated with Release 1.8 of the Tri-Service Spatial Data Standards (TSSDS). This release focuses on environmental compliance and restoration. Space and utility management standards are currently under development for the FMS. The extent and breadth of data to be addressed in the FMS are enormous and will require several years to complete. For this purpose, the FMS Task Group prioritized data content for the Center's FMS development efforts.

Also in 1999, an FMS Task Group, consisting of representatives of the FM Field User Group and other FM experts within the DoD, developed a definition and scope for the FMS: *"The scope of Facility Management Standard is the data describing the control and reporting of real property and derived entities that must be considered in its use."*

Guidance and Use of GIS Technology for Environmental Restoration and Compliance Applications

There has been a general lack of understanding in the field of how to implement a GIS and the SDS/FMS for environmental restoration and compliance activities. To address this problem, the Center's Environmental Field User Group (FUG) developed a web site (http://tsc.wes.army.mil/contacts/groups/fwg/environmental/env/index.htm/) containing GIS implementation guidance and case studies. The site includes success stories illustrating use of a GIS at Aberdeen Proving Ground, the Naval Complex - Philadelphia, the Air Force Center for Environmental Excellence, and Robins Air Force

Base. The latter has provided cost and efficiency benefits in accomplishment of environmental restoration or compliance activities. Subjects addressed under GIS implementation for environmental restoration and compliance include (1) Needs Assessment, (2) Systems Analysis, (3) Data Acquisition, (4) Staffing, (5) Training, (6) Maintenance, (7) Cost Benefit, (8) Contract Specifications, and (9) Contract Vehicles.

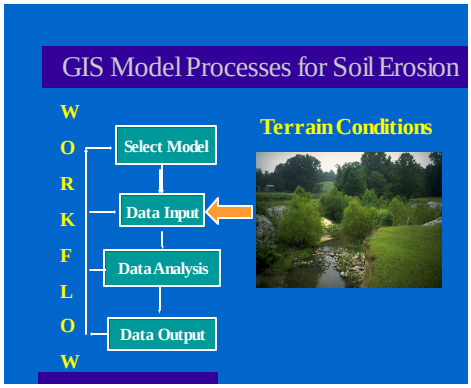


CADD/GIS Project Registry Clearinghouse

The CADD/GIS Project Registry Clearinghouse is a Microsoft Access database developed by the Civil Works Field User Group. This database contains information about projects using CADD/GIS applications. This registry includes contact information, data themes, description of the CADD/GIS applications, study abstracts, benefits, special problems, and innovations. The registry will help users to find existing projects that may aid them in the development of their own projects. The registry contains information about 97 projects provided by members of the Civil Works Field User Group. The database can be queried or project information can be added from the Clearinghouse web site at http://www.nww.usace.army.mil/apps/tscwrc/, illustrated below:

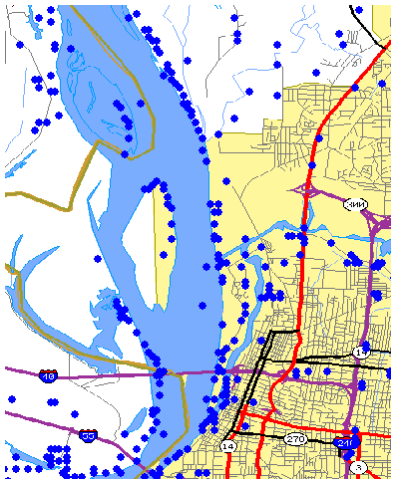
Soil Erosion Model Guide

The Center continued to provide products that support the diverse natural and cultural resources field activities. The Natural and Cultural Resources Field User Group addressed these land management issues and field concerns regarding soil erosion problems and available soil prediction tools. This resulted in the Center report on " Soil Erosion Model Guide for Military Lands: Analysis of Erosion Models for Natural and Cultural Resources Applications." In this report, 24 current soil erosion models were evaluated against a set of criteria intended to provide the user community guidance on the best model to support ecosystem management programs and environmental stewardship. Model assessments are summarized in easy-to-understand references, including fact sheets, matrix tables, institutional/agency support and points of contact, and web site resources. The report is available at http://tsc.wes.army.mil/Products/soil_model_guide/default.asp/.



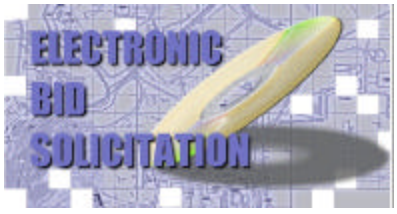
Survey Engineering and Monument Management System

The Survey Engineering and Monument Management System (SEMMS) is a utility software developed by the Center with the assistance of a task group consisting of the Center' s field representatives. SEMMS uses a survey control database schema and common data fields associated with the SDS and other government agencies producing survey engineering geospatial data products. This software provides the means for survey control data entry, retrieval, and maintenance. SEMMS promotes consistency among various offices within the Tri-Services agencies in the management and dissemination of survey control data. It also contains all the existing National Geodetic Survey control data for the entire United States and territories.



The Center developed a web-enabled SEMMS to provide public access to the database. The software has been installed at the Memphis District and can be accessed at http://www.mvm.usace.army.mil/Survey/MvmSEMMS/. A view of the Memphis District' s monument data in northwest Memphis is provided above.

Electronic Bid Solicitations



Participation in the 1999 Electronic Bid Solicitations (EBS) program grew to a total of 48 agencies (38 Corps of Engineers, 7 Navy, 2 Air Force, and 1 Coast Guard). The Center' s EBS web site (http://tsn.wes.army.mil/) has become one of the leading sources of information for contractors and printing companies. The EBS web site has become a contractor starting point for locating

Federal solicitations. The Center also maintains a database of printing companies that are capable of printing the plans and specifications from the solicitation CD-ROMs. In 1999, two PROSPECT courses on EBS were filled to capacity and received very good reviews.

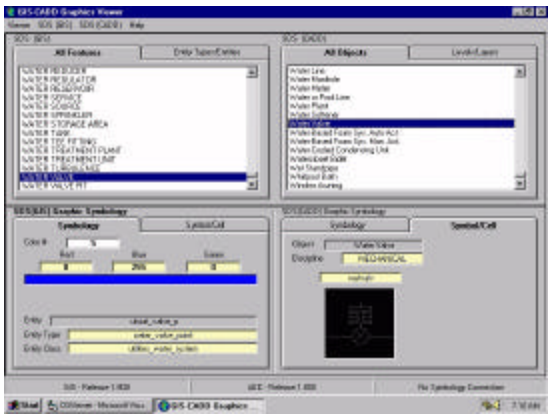
Library of CADD Designs

The Library of CADD Designs was developed to make information on completed design projects available to all designers. The intent is to give designers another tool to use in the design of new projects. The information contained in this library has been collected from Corps Districts and offers designers numerous benefits, such as being able to locate information that might not otherwise be readily available to them, saving time in the development of new designs, and obtaining new ideas by looking at the designs of others. This sharing of information leads to better designs, reduced cost, and improved communication among designers. There are currently over 97 projects in the library, and over 500 visitors have visited the site. The library can be accessed at http://cadlib.wes.army.mil/.

Integration of CADD and GIS Standards and Digital Data

A new tool, called the CADD/GIS Graphic Viewer (CGViewer), has been developed to facilitate the life-cycle process (planning, design, construction, and operations/facility management) of DoD installation and civil works project development. The CGViewer provides the following capabilities:

- Upon selection of an SDS Feature, the CGViewer will display the corresponding A/E/C CADD Object Level/ Layer, Name/Number, and File Name or will indicate if there is no corresponding feature/object.



- On selection of a CADD Object, the CGViewer will display the corresponding SDS Entity Set, Entity Class, Entity Type, and Entity.

- The CGViewer displays selected GIS Feature-A/E/C CADD Object Line Style, Color, Line Weight, Symbol Name/Library, and Graphic Symbol (raster image).

- The CGViewer will identify/summarize features/objects with incomplete or missing symbology information, from either the GIS or A/E/C CADD Standard.

The CGViewer is the first step in providing a tool for seamless conversion of CADD-based drawings/details construction information into a GIS-based operations/facility management system that is compliant with the SDS.

Civil/Site Solutions Manual

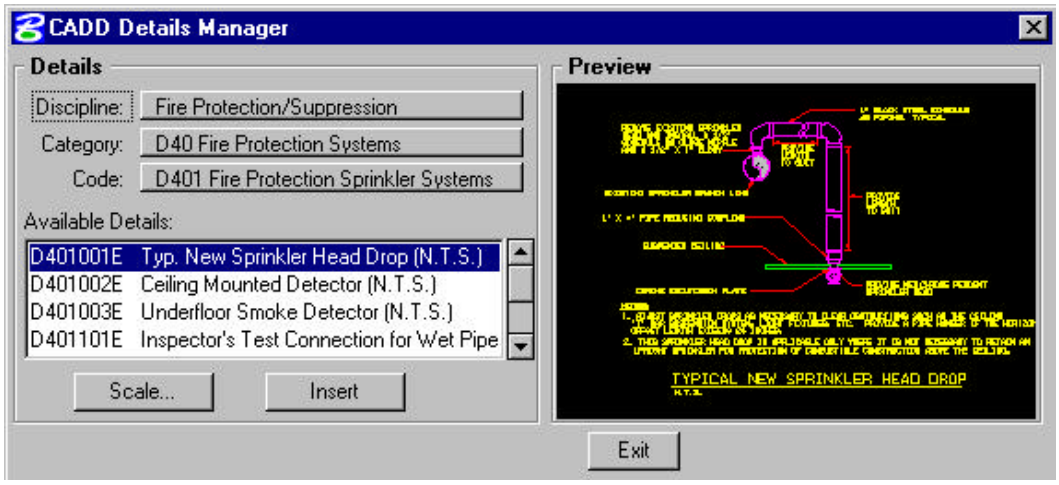
The *Civil/Site Solutions Manual* was developed to document design methods for common civil/site layout problems, using the most common civil design programs in the DoD community. A survey of Corps users was conducted, and the Intergraph Corporation' s InRoads software package was selected for the development of solutions. The *Civil/Site Solutions Manual* provides solutions for about 30 tasks involving Building Site Development, Utility Layout, Levees, Channels, Embankment Dams, Roadways, and Hydraulic Designs. The manual documents the solution methods providing Workflow Wizards, Decision Tables, Shortcuts, and other supporting aids for the designer. The manual and all resources developed are available at http://tsc.wes.army.mil/Products/Civil_Site/.

CADD Details Library Release 2.0

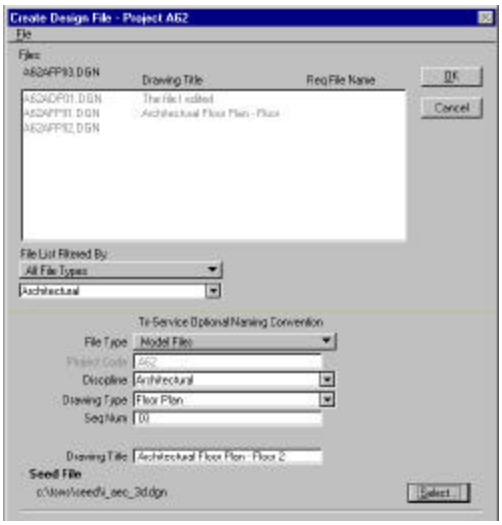
Architects and engineers are constantly requesting libraries of existing construction details for possible use in their projects. Release 1.0 of the CADD Details Library (CDL) was released with much demand and acclaim. In FY99 Release 2.0 of the CDL continued the tradition of providing useful details to field personnel as well as offering improvements over the previous product.

In addition to the Architectural; Mechanical; Electrical; and Hazardous, Toxic, and Radioactive Waste disciplines covered on the Release 1.0 CD-ROM, Release 2.0 adds the Interior Design, Structural, Telecommunications, and Civil/Site disciplines. Additionally, over half the Architectural details on the CD are provided in metric as well as inch-pound format. The resulting CD contains over 1,500 details in both AutoCAD and MicroStation formats.

One improvement to the CD includes a setup routine that will assist the user in installing the CADD Details Manager tool in either MicroStation or AutoCAD (previously, users had to install it on their own). Also, the CADD Detail Manager has been modified to be more discipline friendly. Rather than having to search through different building categories to find a particular detail, the user can search for the detail based on the discipline. As a bonus to the user, discipline reports on detail creation and usage have been included on the CD in PDF format.



MicroStation File Manager

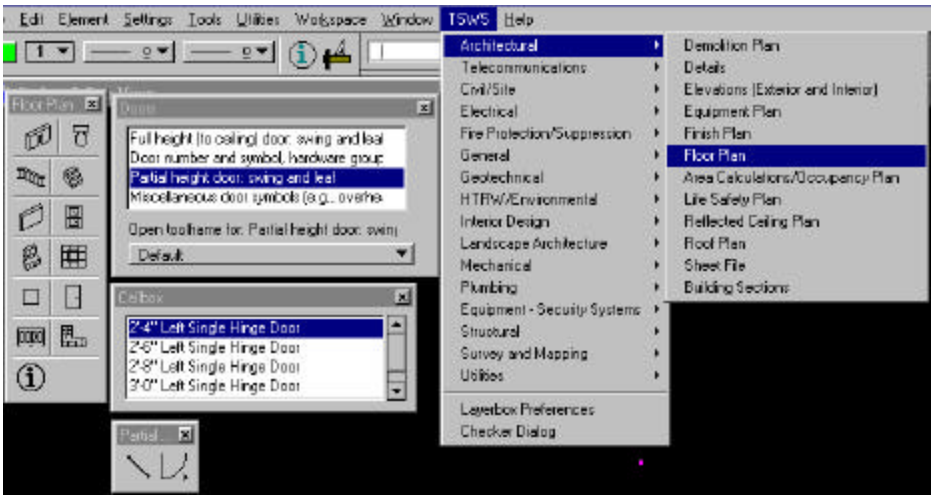


Maintaining conformance to a file-naming convention for A/E/C CADD files can be a frustrating job for both designers and system administrators. With the distribution of Release 1.8 of the A/E/C CADD Standard, users must adapt to a new file-naming convention based on the U.S. National CAD Standard. In the Workspace tool provided with the A/E/C CADD Standard, the CADD file Checker utility will not work properly with files that do not follow the A/E/C CADD Standard file-naming convention.

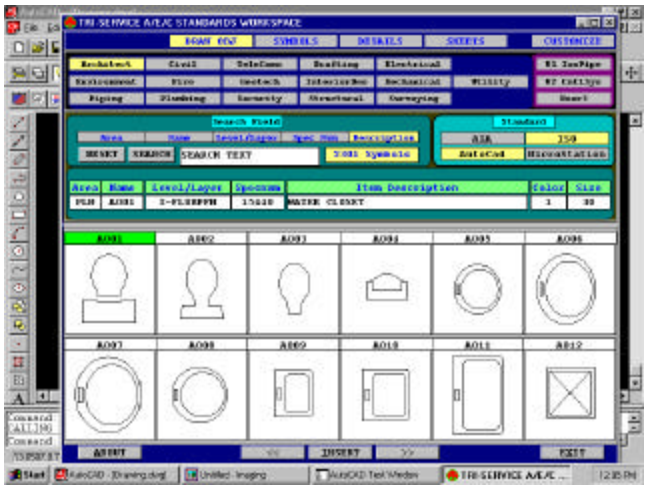
To aid users in the naming of Micro-Station design files, a File Manager utility was developed. This tool replaces the typical MicroStation file manager and aids the user in creating a file name based on the A/E/C CADD Standard file-naming convention. This tool works for both model and sheet file-naming conventions. The user selects a project code, the discipline, the drawing type, and user-definable characters without the necessity of referring to the Standard document. The product works seamlessly and flawlessly with the A/E/C Workspace and makes using the Checker routine a simple process. Locating existing files is also easy using the File Manager's sort and search capabilities.

A/E/C CADD Standard Release 1.8

Release 1.8 of the A/E/C CADD Standard was finalized in FY 1999 with much anticipation. This release of the Standard includes implementation tools to assist the user in conforming to the Standard. Now, users can simply select icons on MicroStation palettes, and the correct graphic symbology will be set, eliminating the need for the user to find and refer to the appropriate level table. The Workspace also has a Checker routine that analyzes drawings and provides a list of items that are not in compliance with the standard. Even though the workspace was not finalized at the end of FY 1999, the Center proceeded with classes for System Administrators on the modification and installation of the Workspace generator. The MicroStation Workspace was completed in FY 2000. An AutoCAD version of the Workspace is also in development for FY 2000.



Utilities for the Workspace for AutoCAD Users

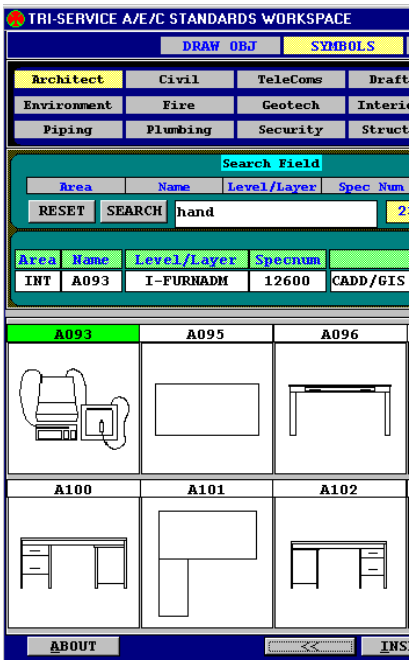


The AutoCAD utility is being designed as the corollary to the Workspace product that developed for Micro-Station and will support those offices of the military that are using AutoCAD for drawing documents. The objective is to have both AutoCAD and MicroStation users producing identical symbology for government projects across the country. The AutoCAD utility (with a Visual Basic generated interface) allows access to various objects and symbols as well as word searches based upon object descriptions and specification numbers.

The utility is being adapted from the CE-CADD application developed by the Coast Guard to provide a standard basis for their CADD designs.

Selections will be made from a menu for various disciplines including architectural, civil, security, environmental, and communications, and the standard symbology will be automatically set. Standard drafting symbols that have been organized by the Center are a part of this package, as well as specialized symbols and applications.

The AutoCAD utility is being designed to access the same text file that is generated by the MicroStation database and will assign layers and line types for entities selected. The Workspace uses about 1,700 bitmaps for symbol type, 2,700 AutoLisp routines, and 128 files.



InRoads Preference Sets Conforming to the CADD Standard

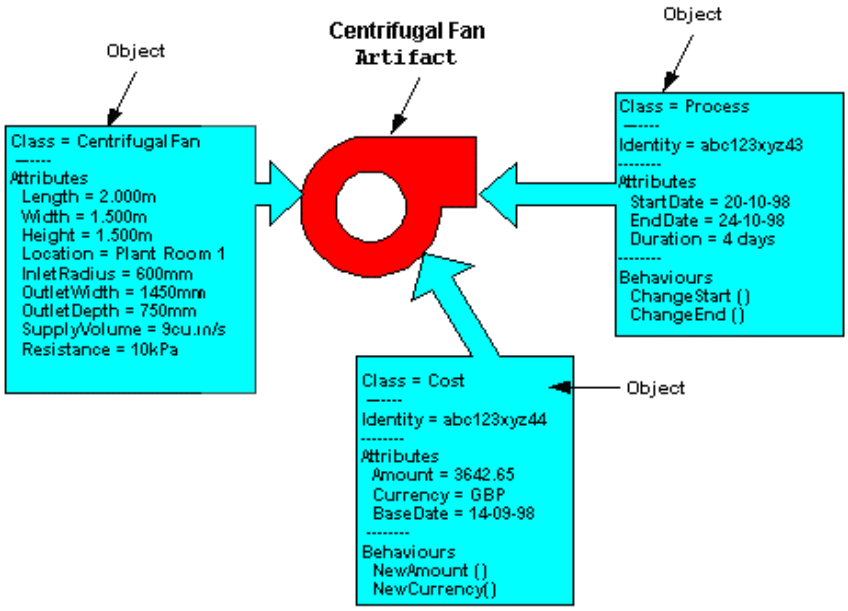
The development of the InRoads preference sets conforming to the CADD standard is allowing users in the civil/site discipline to easily use standards without the tedious task of setup or user intervention during a work session. The A/E/C CADD standard has become the de facto standard of many state, local, and federal agencies and private enterprises. This standardization will allow complete conformity when using InRoads for civil/site design.

Projects such as this one are pushing the reality of standards usage to a new level of acceptance worldwide. This project is an example of how standards can be used without negative impact on user productivity, translating into large savings with increased productivity. The InRoads Preference Sets as well as other similar future projects are

allowing for increased productivity with standardization across many diverse organizations.

Object Standards

Under the A/E/C Object Standards project, the Center collaborated with businesses and other government agencies to advance the standardization of objects under the International Alliance for Interoperability (IAI). Object standards are an interoperability framework that enables products from software vendors that support the objects to transfer and share information. The framework developed by the IAI concentrates on domains of interest to the international A/E/C community. The North America Chapter of the IAI is the most aggressive and best funded of the international alliance. The Center' s involvement in this process enables the Center to promote standard operations and data that are necessary for Federal government processes. The Center chairs the Facilities Management Domain Committee and the Project Management Domain Committee. These committees have established standard objects for processes in Move Management, Construction Management, Project Management, and the core layer. These committees must also validate the work of other domain committees and resolve issues that arise when another committee requires data or functionality that conflicts with the already developed objects. Project Management objects are those that model construction of facilities and the management of the construction. Facility Management objects are those that model the structures and facilities that need to be managed. These two domains require coordination with other domains, like the A/E/C domain and the Codes and Standards domain, to ensure that the design is constructed and the constructed facility can be maintained.



Federal Geographic Data Committee Standards

The final draft of the Spatial Data transfer Standards (SDTS) Part 7: CADD Profile was submitted to the Standards Review Council for the Federal Geographic Data Committee (FGDC) Facilities Working Group (FWG). There were no public comments concerning the CADD Profile, and the final draft has been revised using comments received from the Standards Working Group. The CADD Profile document has been coordinated with the FGDC mailing list and 30 CADD vendors, soliciting industry

comments. In November 1998, the Profile was presented at an SDTS Workshop and in May 1999, at the American Drafting and Design Association Conference. This finalizes another part of the FGCD Standards.

IM/FCAD2

The IM/FCAD2 Program completed another productive year in providing the latest CADD and GIS products and services to customers throughout DoD and other federal agencies. Many positive changes occurred in FY99 as the program continued to make improvements and enhancements. Both IM/FCAD2 contractors, Intergraph and Tracor, reported that business activity continued on par with the last fiscal year.

One of the most significant changes was an extension of the buying period. Originally scheduled to expire in August 2001, the contracts' buying period was extended 4 years to August 2005. The extension was the result of negotiations where in exchange for allowing the government to remove certain mandatory use requirements, the contractors were given 4 additional years for purchasing products.

To provide customers a one-stop shopping place, the program has implemented a procedure to provide customers with total solutions. If most of a customer's needs can be met by the available items on contract, additional items required to complete the solution can also be provided. The contracting officers will locate the additional items on the most favorable vehicle available and provide it along with the remainder of the order.

In an effort to provide more flexibility and responsiveness to the customers, a pilot program has been initiated for electronic ordering and is currently undergoing testing. When complete, the new ordering process will provide another option for those who wish to take advantage of this web technology.

As in previous years, the contracts were updated with numerous new technology insertions providing both new products and the latest releases of existing hardware and software. As part of the program's Y2K certification process, every item on both contracts was reviewed for compliance. During this process, the contracts were also purged of the majority of all outdated items, thus making product searches much easier.

The IM/FCAD2 web page also continued to be improved and enhanced. A new area was added that allows customers to view site-specific implementations at various customer locations.

Finally, McBride Associates recently purchased Tracor ES. Their name will soon be changing, but they will continue to be an IM/FCAD2 contractor. All other changes are expected to be positive.